UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PER ALMDAHL and JEFFREY CHARLES EDWARDS

Appeal 2007-3756
Application 10/501,325
Technology Center 3600

Decided: December 14, 2007

Before: TERRY J. OWENS, JENNIFER D. BAHR, and STEVEN D.A. McCARTHY, *Administrative Patent Judges*.

McCARTHY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134 (2002) from the final rejection of claims 7-9 and 15. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

The Appellants' invention relates to a riser control device for use in sub-sea oil and gas installations. Independent claim 7 and dependent claim 8 are representative of the Appellants' claims and read as follows:

> 7. A riser control device for use with spool or horizontal production trees for a well in sub-sea oil and gas installations, said device comprising:
>
> a housing;
>
> a pair of radially movable rams *disposed within said housing*, said rams being disposed in opposed relation for isolating the well;
>
> a pair of radially movable shear blades *disposed within said housing*, said blades being disposed in opposed relation for cutting off an intervention string; and
>
> *a vertically disposed actuator assembly, disposed within said housing, for simultaneously driving said rams and said blades*.
>
> 8. The riser control device as claimed in claim 7, wherein said vertically disposed actuator assembly comprises *a hydraulically driven annular piston disposed in an annular chamber*, a piston rod connected to said piston, and a translation beam connected to said piston rod for transmitting movement of said piston to open or close said rams and blades.

[Emphasis added.]

Claims 7-9 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Jones (U.S. Patent 4,580,626) in view of Owens (U.S. Patent 4,441,742).

We affirm the rejection of claims 7 and 15. We reverse the rejection of claims 8 and 9.

ISSUE

The two issues in this appeal are:

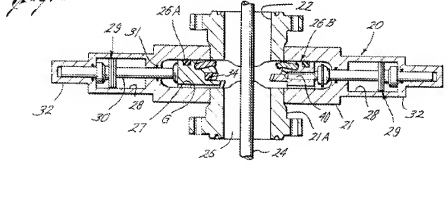
(1) whether the Examiner erred in contending that a riser control device including a housing and a vertically disposed actuator assembly disposed within the housing driving radially moving shear blades and rams, also disposed within the housing, would have been obvious from the blowout preventer ["BOP"] taught by Jones and the vertical actuator in Owens' connector; and

(2) whether the Examiner erred in contending that Owens teaches an "annular piston."

FINDINGS OF FACT

The record supports the following findings of fact ("FF") by a preponderance of the evidence.

1. Jones teaches what the Appellants characterize as a "known blowout preventer" ["BOP"]. (Br. 6). Figure 1 of Jones, reproduced below, is a side sectional view showing Jones' BOP *20* in an open state with a pipe *24* extending through a bore *22* in the housing *21* of the BOP:



2. The BOP includes a pair of radially disposed cylinders *28* opposed across the bore *22*; a pair of pistons *29* reciprocable within the cylinders; a pair of piston rods connected for movement with the pistons; and pair of rams *26A* and *26B* mounted on the piston rods in opposing relation for movement between an open position allowing access to a well through the bore and a closed position isolating the well. (Jones, col. 7, ll. 14-49). Each ram has a cutting blade (no reference numeral in Fig. 1) for shearing the pipe *24* or other structure within the bore when the rams move to the closed position. (Jones, col. 7, l. 50 – col. 8, l. 14). The cylinders, the pistons, the piston rods, the rams and the cutting blades are disposed within the housing *21*. (Jones, Fig. 1).

3. Owens teaches a remotely-operated connector designed to secure the lowermost body of a BOP stack to an upright wellhead lower body with a large clamping force. (Owens, col. 1, l. 5-8; col. 2, l. 65 – col. 3, l. 2 and col. 3, ll. 49-52). The connector includes a housing secured to the BOP stack body and vertically-disposed pistons and cylinders which drive segment bodies radially into an annular groove in the wellhead body to clamp the BOP stack onto the wellhead.

4. More specifically, Owens' connector includes vertically disposed cylinders and pistons coupled through piston rods to an annular driving ring. The driving ring has a frusto-conical inner surface which tapers downwardly and radially outwardly from the wellhead body. (Owens, col. 4, l. 56 – col. 5, l. 20). The connector also includes frusto-conical follower bodies having outer surfaces parallel to the inner surface of the driving ring. (Owens, col. 4, ll. 42-50 and Fig. 1). Rollers separate the facing frusto-conical surfaces of the driving ring and the follower bodies.

(Owens, col. 5, ll. 21-32). Each follower body is connected by a connector pin to one of the segment bodies. (Owens, col. 4, ll. 50-55).

5. Vertical actuation of the pistons and cylinders drives radial movement of the segment bodies. When the pistons and their associated piston rods retract into the cylinders, the frusto-conical surface of the driving ring slides downwardly relative to the facing frusto-conical surfaces of the follower bodies. The rollers transfer this relative motion to the follower bodies, deflecting the follower bodies and the segment bodies radially inwardly toward the annular groove in the wellhead body. (Owens, col. 6, ll. 26-35). Owens teaches that this actuation assembly improves the efficiency of the connector by reducing the sliding friction of the mechanism as compared with the friction in conventional connectors. (Owens, col. 7, ll. 16-44).

6. Owens' connector includes a housing. The housing includes a segment-carrying ring designed to bolt onto a flange on the lowermost body of the BOP stack; a transverse support plate extending radially outwardly from the lower end of the segment-carrying ring; a transverse closure member extending radially outwardly from the upper end of the segment carrying ring; and a cylindrical outer wall member bridging the outer edges of the transverse support plate and the transverse closure member. The cylinders, the pistons, the driving ring and the follower bodies are all disposed in an annular space within this housing. The segment bodies are disposed within annular grooves in the segment-carrying ring. (Owens, col. 4, ll. 3-29 and Fig. 1).

PRINCIPLES OF LAW

A claim is unpatentable for obviousness under 35 U.S.C. § 103(a) if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." In *Graham v. John Deere Co.*, 383 U.S. 1 (1966), the Supreme Court set out factors to be considered in determining whether claimed subject matter would have been obvious:

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined.

Id., 383 U.S. at 17.

In order to establish a prima facie case that claimed subject matter is obvious, the examiner must articulate reasons consistent with the level of ordinary skill in the art at the time of the invention why (in the words of 35 U.S.C. § 103(a)) "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." The examiner must derive these reasons from what was within the common knowledge or common sense of those skilled in the art at the time of the invention and not from the applicant's specification. *See Graham*, 383 U.S. at 36 (warning against "the temptation to read into the prior art the teachings of the

invention at issue"). On the other hand, the reasons need not be stated explicitly in a prior art reference. *KSR*, 127 S.Ct. at 1741 ("[T]he analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim . . . ."). The examiner may look to "interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person of ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion" recited in the claim. *Id.* at 1740-41.

ANALYSIS

The Appellants offered arguments regarding the patentability of appealed claims 7-9 and 15 in general. In addition, the Appellants offered arguments directed specifically to the language of claim 8. (Br. 11).[1] Therefore, the Board will consider claims 7 and 15 as a group, with claim 7 being deemed representative of the group. 37 C.F.R. § 41.37(c)(vii) (2007); *In re Dillon*, 919 F.2d 688, 692 (Fed. Cir. 1990) (*en banc*). The Board will consider the patentability of claim 8 and claim 9, which depends from claim 8, separately.

A. The Subject Matter of Claims 7 and 15 is Obvious from Jones in Light of Owens

The first two steps in determining whether the Examiner has established a prima facie case for obviousness are to determine the scope

[1] The Board notes that the Appellants did not provide a separate subheading for the argument addressing claim 8. *See* 37 C.F.R. § 41.37(c)(vii) (2007).

and content of the prior art; and to ascertain the differences between the prior art and the claims at issue. The prior art of record includes the teachings of Jones and Owens. Jones teaches a BOP which includes a pair of radially movable rams (*26A* and *26B* in Fig. 1, reproduced above) disposed in opposed relation for isolating the well; a pair of radially movable shear blades disposed in opposed relation for cutting off an intervention string; and an actuator assembly (*28-31* in Fig. 1) for simultaneously driving the rams and the blades. (FF 2). Jones' BOP differs from the claimed subject matter in that Jones fails to disclose a "vertically disposed actuator assembly" for driving the rams and the blades; and a housing within which the rams, the blades and the vertically disposed actuator assembly are disposed. These elements are taught by Owens.

The third step in determining whether the Examiner has established a prima facie case for obviousness is to resolve the level of ordinary skill in the art. The factors which may be considered in determining the level of ordinary skill include the teachings of the prior art references themselves and the sophistication of the technology. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007). Those skilled in the art would have been aware that sub-sea structures are exposed to the pressure and corrosive effects of seawater. (*E.g.*, Owens, col. 1, l. 61 – col. 2, l. 6). Common sense would have dictated the desirability of enclosing sensitive parts in protective housings. The construction of a suitable housing would not require sophisticated technology and would be within the skill in the art, as illustrated by the housing described in Owens. (*See* FF 5).

The final step in determining whether the Examiner has established a prima facie case of obviousness is to determine whether the Examiner

articulated reasons why the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art. The reasons for combining the teachings of the prior art may arise from the nature of the combination itself. For example, it generally is obvious to use a technique already known to improve one device in order to improve another similar device. *Leapfrog Enterps. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007).

In the present case, it would have been obvious to improve Jones' conventional BOP by using the vertically disposed actuation assembly taught in Owens. Owens teaches that the vertically disposed actuator assembly described therein improves the efficiency with which hydraulic pressure is converted into radial sliding motion. (FF 4). Since the range of movement of the rams in Jones' BOP and the segment bodies in Owens' connector are similar, one of ordinary skill in the art could have predicted that the application of Owens' vertically disposed actuator assembly to Jones' BOP would have improved the shearing force of the blades for a given hydraulic power input. Therefore, the use of Owens' vertically disposed actuator assembly in a BOP of otherwise conventional design such as Jones' would have been obvious.

The Appellants argue that if the teachings of Jones and Owens are combined, "the resulting structure would simply be a combined BOP and connector." (Br. 9). The criterion for obviousness is "not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art." *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985). Prior art references may teach more than their

preferred embodiments. The teachings of the prior art include (but are not limited to) the problems which the references address and any improvements which the references advance as solutions to those problems. In the present case, both the use of Owens' connector to secure Jones' BOP onto a wellhead and, more pertinently, the substitution of Owens' vertically disposed actuator assembly for the radially disposed assembly of Jones would have been obvious from the teachings of the references.

The Appellants contend that "Owens teaches that the connector mechanism is provided in a separate housing or pocket on the *outside* of the well housing. This is clearly different from the device defined in claim 7 in which the vertically disposed actuator assembly is provided inside the housing of the riser control device." (Br. 10 [emphasis in original]). Owens suggests (as common sense would have suggested) the disposition of sensitive parts such as the actuator assembly, the rams and the blades in a protective housing. In other words, the disposition of these parts in a BOP housing would have been obvious.

Claim 7 is not limited to a riser control device housed inside the well housing. "During examination, 'claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.'" *In re American Acad. Of Science Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (quoting *In re Bond*, 910 F.2d 831, 833 (Fed. Cir. 1990)). Nevertheless, although claims are to be read in light of the specification, they are limited only by their language and not by features of the preferred embodiment disclosed in the specification. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Given its broadest reasonable interpretation, the term "housing" as used in claim 7 is not limited to the well housing. Jones' use of the term "housing" to refer to the entire structure enclosing Jones' BOP, including the both the portion of the housing in line with the well head and the horizontal pockets in which the cylinders are formed (*See, e.g.*, Jones, col. 7, ll. 14-20, 36-44 and 50-54), suggests that those of ordinary skill in the art would not understand the term "housing" to be limited to the well housing alone. Nothing in the specification suffices to prove use of the term "housing" to refer only to the well housing. Therefore, the term "housing" as used in claim 7 is broad enough to encompass a riser

The Appellants have submitted no evidence sufficient to rebut the prima facie case. On the record before us, the subject matter of claim 7 was obvious. Claim 15 falls with claim 7. On the record before us, the Appellants failed to show that the Examiner erred in rejecting claims 7 and 15 under 35 U.S.C. § 103(a).

B. The Subject Matter of Claims 8 and 9 is Not Obvious from Jones in Light of Owens

The Examiner rejected claims 8 and 9 as unpatentable over Jones in light of Owens. Jones' BOP differs from the subject matter of claim 8 in that Jones' BOP does not include a "vertically disposed actuator assembly" having "a hydraulically driven annular piston disposed in an annular chamber." There is insufficient evidence in the record from the teachings of Owens or otherwise to show that the incorporation of this feature into a riser control device was within the level of ordinary skill in the art. On the record

before us, the subject matter of claim 8 and claim 9, which depends from claim 8, is unobvious.

The Examiner contends that Owens' "piston arrangement" is "annular since these elements are annularly located on the riser . . . ." (Ans. 6). Owens teaches the use of "[a] plurality of circumferentially spaced fluid pressure operated rectilinear hydraulic motors" including cylinders to actuate the driving ring within Owens' connector. (Owens, col. 4, l. 65 – col. 5, l. 4). To the extent that the Examiner contends that claims 8 and 9 cover riser control devices having pluralities of annularly located circular pistons as suggested in Owens, the contention is not supported by any reasonable interpretation of the claim language. Claim 8 recites "a hydraulically driven annular piston," not pistons. Hence, "annular" must be a characteristic of a single piston rather than of the location of a plurality of pistons. As stated earlier, the absence of any disclosure of "a hydraulically driven annular piston disposed in an annular chamber" from the teachings of Jones and Owens implies, on the record before us, that the subject matter of claims 8 and 9 is unobvious.

CONCLUSION OF LAW

On the record before us, the Appellants failed to show that the Examiner erred in rejecting claims 7 and 15 under 35 U.S.C. § 103(a). The Appellants have shown that claims 8 and 9 cannot reasonably be interpreted broadly enough to encompass riser control devices having pluralities of annularly located circular pistons as suggested in Owens. By doing so, the Appellants have shown that the Examiner erred in rejecting claims 8 and 9.

DECISION

The Examiner's rejection of claims 7 and 15 is affirmed. The Examiner's rejection of claims 8 and 9 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED IN PART AND REVERSED IN PART

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